

Table of Contents

Halfway Boulevard Wetlands and Waterways Delineation	2
Halfway Boulevard Noise Analysis	29
Halfway Boulevard Maryland Historical Trust	52
Halfway Boulevard Fish and Wildlife Review	53
Halfway Boulevard Dept of Natural Resource Review	54

MEMORANDUM

TO: Mark Mishler, Washington County Division of Engineering

FROM: Scot Aitkenhead, PWS, Wallace Montgomery

DATE: October 11, 2018

RE: Wetlands and Waterways Delineation

WM PROJ. No.: 214038.0007

WM PROJ. DESCR.: Halfway Boulevard Extended

1.0 INTRODUCTION

On behalf of the Washington County Division of Engineering, Wallace Montgomery (WM) conducted a field investigation to document the presence of wetlands and waterways within the project area on September 11, and September 20, 2018. This memo provides a description of wetlands and waterways identified within the project area.

The proposed project will extend Halfway Boulevard approximately 2,800 feet west from its terminus at New Gate Boulevard to Greencastle Pike in Hagerstown, MD (Appendix A). The roadway will be four lanes and will also include the construction of a culvert over an unnamed tributary to Conococheague Creek.

2.0 METHODS

2.1 Preliminary Review

WM reviewed available GIS data for a preliminary review of potential streams and wetlands based on recorded vegetation, soil, and hydrologic characteristics prior to conducting the field investigation. The available data used included the following:

- The U.S. Geologic Survey (USGS) topographic map (Mason-Dixon Quad);
- Federal Emergency Management Agency (FEMA) floodplain map (Appendix A);
- The National Wetlands Inventory (NWI) and Maryland Department of Natural Resources (DNR) Wetland maps (Appendix A);
- Natural Resources Conservation Service's (NRCS) Web Soil Survey (Appendix A).

2.2. Field Assessment

WM conducted a field investigation for the presence of wetlands and waterways using the Routine Determination Method described in the 1987 *Corps of Engineers Wetlands Delineation Manual* and the 2012 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountain and Piedmont Region (Version 2.0)*. Under normal circumstances, for an area to be classified as a wetland the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) hydrology is mandatory. For the classification of streams and rivers, a well-defined bed and bank morphology, a high water mark, or evidence of flowing water is required. All identified wetlands and waterways were classified according to



A Classification of Wetland and Deep-Water Habitats in the United States. The wetland indicator status of the observed vegetation was identified using the 2017 *National Wetland Plant List (Version 3.3)*.

Observations were made in the field to identify atypical conditions such as artificial disturbance that may have influenced the presence of hydric soils, hydrology, or vegetation. Vegetation, soils, and hydrology were examined; waterways were flagged with pink flagging and mapped using GPS.

3.0 RESULTS

3.1 Preliminary Review Results

The study area falls within the Conococheague watershed (MDE 8-digit 02140504). The study area is within a FEMA mapped 100-year floodplain. DNR wetland mapping identifies one stream within the project area (R3UBH). Web Soil Survey (NRCS) data indicates ten soil types within the study area (Table 1). One is considered to be hydric.

Table 1: Soil Survey Data

Map Unit Symbol	Map Unit Name	Hydric Soil
Ft	Funkstown silt loam	No
HaB	Hagerstown silt loam, 3 to 8 percent slopes	No
HbB	Hagerstown silty clay loam, 3 to 8 percent slopes	No
HcB	Hagerstown-Rock outcrop complex, 3 to 8 percent slopes	No
HcC	Hagerstown-Rock outcrop complex, 8 to 15 percent slopes	No
HcD	Hagerstown-Rock outcrop complex, 15 to 25 percent slopes	No
Ln	Lindside silt loam	No
Me	Melvin silt loam	Yes
OrC	Opequon-Rock outcrop complex, 8 to 15 percent slopes	No
SpA	Swanpond silt loam, 0 to 3 percent slopes	No

3.2 Field Assessment Results

WM identified one wetland (WET) and two waterways (WW) within the study area. A summary of the resources is included below in Table 2. A map and photographs are provided in Appendices A and C, respectively. A record amount of rainfall has occurred over the last four months within the Hagerstown, MD area.

Table 2: Summary of Delineation Findings

Waterways	Stream Classification
WET1	PEM2f
WW1	R2UB1
WW2	R2UB3

3.2.1 Wetlands and Waterways Descriptions

Wetland 1 (WET1)

WET1 is located within an active farm field at the northwest extent of the study area, approximately 350 feet from Greencastle Pike. It is classified as a palustrine emergent wetland with nonpersistent vegetation



(PEM2f). The wetland abuts WW2 to the west, which appears to be the source of hydrology for this area. Data Plot #3 (DP-3) was used to characterize WET1. Hydrology indicators were Surface Water (A1), Saturation (A3), Algal Mat or Crust (B4), Recent Iron Reduction in Tilled Soils (C6), Drainage Patterns (B10), Saturation Visible on Aerial Imagery (C9), and Stunted or Stressed Plants (D1). Since the field is actively used for crops, the most abundant plant present was soybean (*Glycine*, sp.), which does not have a wetland indicator status. Hydric soil indicators observed were Dark Surface (S7) and Iron-Manganese Masses (F12). Representative photos are included in Appendix C.

Waterway 1 (WW1)

WW1 (Unnamed Tributary to Conococheague Creek) is classified as a perennial stream with a cobble/gravel substrate (R2UB1). The stream enters the study area from the north and flows south before continuing beyond the study area. The channel meanders through two forest stands and an open farm field, currently being utilized for grazing horse and cattle. The livestock have full access to the stream. The stream varies in width, averaging approximately 10 feet. The banks are wider at locations frequently used for cattle crossing. These areas have also accumulated sediment on top of the cobble/gravel substrate. WW1 is designated as a Use IV-P stream. Representative photos are included in Appendix C.

Waterway 2 (WW2)

WW2 is classified as a perennial stream with a mud substrate (R2UB3). It enters the study area from the northwest, in close proximity to Greencastle Pike. WW2 flows in a southeast direction through an active farm field and small residential property before its confluence with WW1. It should be noted that there were three inches of rainfall recorded the previous day (9/9/18), and a total of five inches over the course of the previous four days. At the time of investigation, the stream had exceeded its banks creating a large area of sheet flow through the soybean field. The stream channel limits were delineated based on visible stream characteristics such as defined bed and banks, sediment sorting, and scour in addition to recent aerial photography. The stream is approximately one foot wide through the farm field and three feet wide further downstream near the confluence with WW1. Water depths ranged from one to four inches. Representative photos are included in Appendix C.

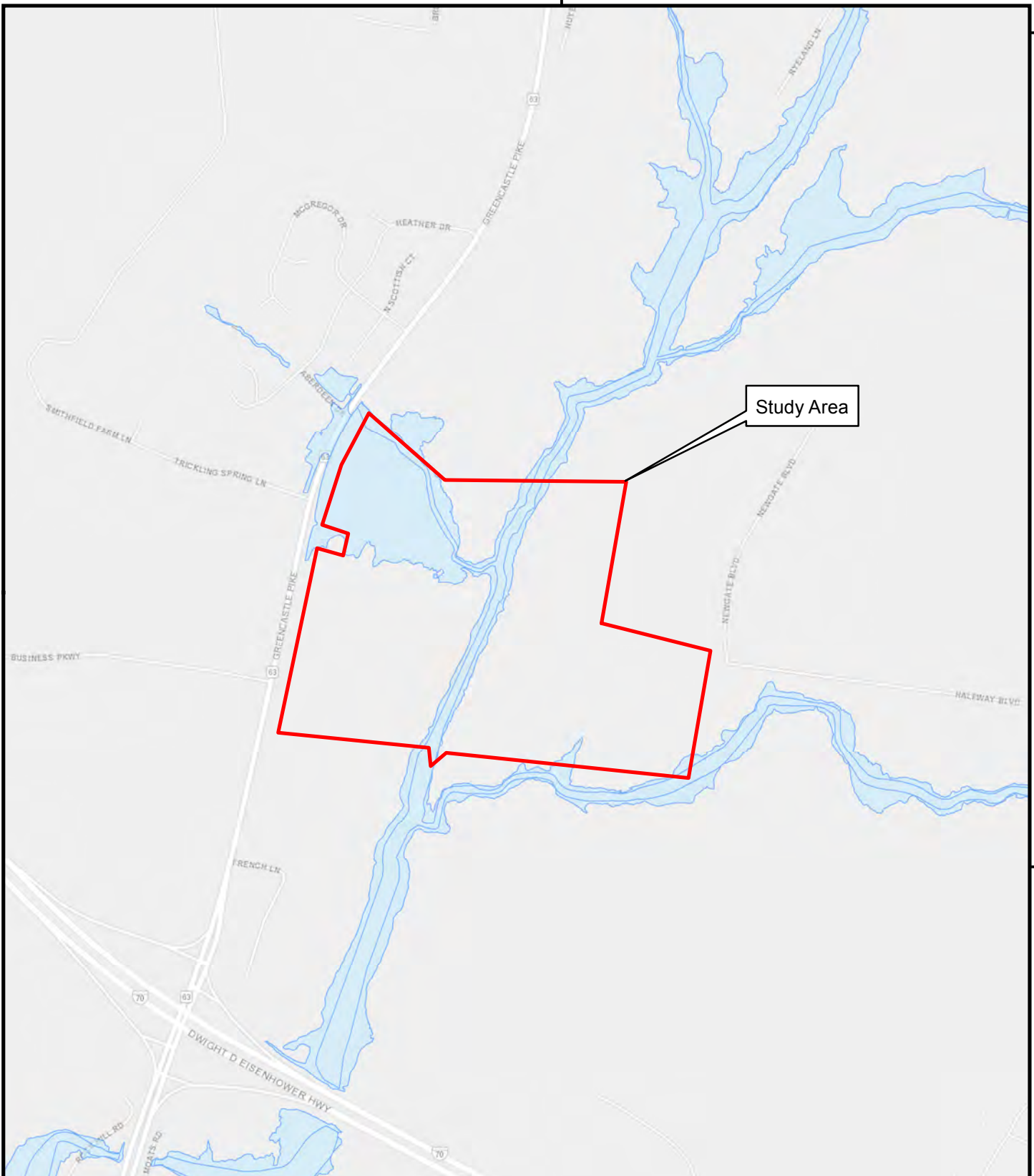
APPENDIX A

MAPPING

77°48'0"W



39°39'0"N

39°38'0"N

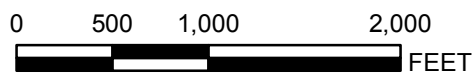


Study Area

LEGEND

-  Study Area
-  100-Year Floodplain (FEMA)

1 INCH = 1,000 FEET



FEMA FLOODPLAIN MAP

HALFWAY BOULEVARD
EXTENDED

OCTOBER 2018

WASHINGTON COUNTY

77°48'0"W

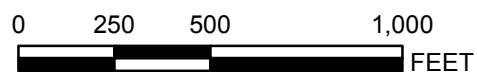


39°38'0"N

Legend

- Study Area
- DNR Stream

1 inch = 500 feet



DNR/NWI WETLANDS MAP

HALFWAY BOULEVARD
EXTENDED

OCTOBER 2018

WASHINGTON COUNTY



Legend <div style="display: flex; justify-content: space-between;"> <div> <div style="border: 2px solid red; width: 20px; height: 10px; display: inline-block;"></div> Study Area <div style="border-top: 2px dashed yellow; width: 20px; display: inline-block;"></div> Proposed Alignment <div style="border-bottom: 2px solid blue; width: 20px; display: inline-block;"></div> Delineated Waters of the U.S. <div style="background-color: green; width: 20px; height: 10px; display: inline-block;"></div> Delineated Wetlands </div> <div> <div style="text-align: center;">↑ Feature Continues</div> <div style="text-align: center;">▲ Data Points</div> <div style="text-align: center;">— 2FT County Contours</div> </div> </div>		1 inch = 500 feet <div style="display: flex; align-items: center;"> <div style="flex-grow: 1; border-bottom: 2px solid black; position: relative;"> 0 250 500 1,000 </div> <div style="margin-left: 10px;">FEET</div> </div> <div style="display: flex; align-items: center; margin-top: 10px;"> <div> WALLACE MONTGOMERY </div> <div style="margin-left: 20px;"> </div> </div>		WETLAND DELINEATION MAP HALFWAY BOULEVARD EXTENDED OCTOBER 2018 WASHINGTON COUNTY	
--	--	---	--	---	--

APPENDIX B
WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM -- Eastern Mountains and Piedmont Region

Project/Site: Halfway Boulevard Extended City/County: Washington Sampling Date: 9/20/18
 Applicant/Owner: Washington County State: MD Sampling Point: DP-1
 Investigator(s): SDA, JAM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): <1
 Subregion (LRR or MLRA): 147 S Lat: 39.638895 Long: -77.801458 Datum: _____
 Soil Map Unit Name: Lindside silt loam NWI classification: UPL
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
 Are Vegetation X, Soil _____, or hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation _____, Soil _____, or hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: Agricultural field abutting stream used for cattle and horses. Heavily grazed, grasses no taller than 1 inch. Data point is within 30 feet of stream bank. There has been 26 inches of precipitation within the last 4 months.	

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Aquatic Fauna (B13)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes <u>X</u> No _____
Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION (Five Strata) -- Use Scientific Names of plants.

Sampling Point: DP-1

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC <u>0</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x1= <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x2= <u>0</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x3= <u>0</u></td> </tr> <tr> <td>FACU species <u>80</u></td> <td>x4= <u>320</u></td> </tr> <tr> <td>UPL species <u>5</u></td> <td>x5= <u>25</u></td> </tr> <tr> <td>Column Totals: <u>85</u> (A)</td> <td><u>345</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>4.1</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x1= <u>0</u>	FACW species <u>0</u>	x2= <u>0</u>	FAC species <u>0</u>	x3= <u>0</u>	FACU species <u>80</u>	x4= <u>320</u>	UPL species <u>5</u>	x5= <u>25</u>	Column Totals: <u>85</u> (A)	<u>345</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x1= <u>0</u>																	
FACW species <u>0</u>	x2= <u>0</u>																	
FAC species <u>0</u>	x3= <u>0</u>																	
FACU species <u>80</u>	x4= <u>320</u>																	
UPL species <u>5</u>	x5= <u>25</u>																	
Column Totals: <u>85</u> (A)	<u>345</u> (B)																	
50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																		
Sapling Stratum (Plot Size: _____)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
_____ = Total Cover																		
50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																		
Shrub Stratum (Plot Size: _____)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
_____ = Total Cover																		
50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																		
Herb Stratum (Plot Size: <u>30'</u>)																		
1. <i>Schedonorus arundinaceus</i>	80	Y	FACU															
2. <i>Plantago lanceolata</i>	5	N	UPL															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
_____ = Total Cover																		
50% of total cover: <u>42.5</u> 20% of total cover: <u>17</u>																		
Woody Vine Stratum (Plot size: _____)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
_____ = Total Cover																		
50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																		
Remarks: (Include photo numbers here or on a separate sheet.) Stream bank vegetation is dominated by <i>Persicaria maculosa</i> .																		

Hydrophytic Vegetation Indicators:
 _____ 1 - Rapid Test for Hydrophytic Vegetation
 _____ 2 - Dominance Test is >50%
 _____ 3 - Prevalence Index is ≤ 3.0¹
 _____ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 _____ Problematic Hydrophytic Vegetation¹ (Explain)

Definitions of Vegetation Strata:
Tree -- Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height.
Sapling -- Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Shrub -- Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Herb -- All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody vine -- All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes _____ No X

SOIL

Sampling Point: DP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- _____ Histisol (A1)
- _____ Histic Epipedon (A2)
- _____ Black Histic (A3)
- _____ Hydrogen Sulfide (A4)
- _____ Stratified Layers (A5)
- _____ 2 cm Muck (A10) (**LRR N**)
- _____ Depleted Below Dark Surface (A11)
- _____ Thick Dark Surface (A12)
- _____ Sandy Mucky Mineral (S1)(**LRR N, MLRA 147, 148**)
- _____ Sandy Gleyed Matrix (S4)
- _____ Sandy Redox (S5)
- _____ Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Dark Surface (S8)(**MLRA 147, 148**)
- Thin Dark Surface (S9)(**MLRA 147, 148**)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12)(**LRR N, MLRA 136**)
- Umbric Surface (F13)(**MLRA 136, 122**)
- Piedmont Floodplain Soils (F19)(**MLRA 148**)
- Red Parent Material (F21)(**MLRA 127, 147**)

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10)(**MLRA 147**)
☐ Coast Prairie Redox (A16)
☐ (**MLRA 147, 148**)
☐ Piedmont Floodplain Soils (F19)
☐ (**MLRA 136, 147**)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soils Present? Yes No **X**

Remarks:

WETLAND DETERMINATION DATA FORM -- Eastern Mountains and Piedmont Region

Project/Site: Halfway Boulevard Extended City/County: Washington Sampling Date: 9/20/18
 Applicant/Owner: Washington County State: MD Sampling Point: DP-2
 Investigator(s): SDA, JAM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): None Slope (%): <1
 Subregion (LRR or MLRA): 147 S Lat: 39.639600 Long: -77.801509 Datum: _____
 Soil Map Unit Name: Lindside silt loam NWI classification: _____
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
 Are Vegetation X, Soil _____, or hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation _____, Soil _____, or hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: Agricultural field abutting the stream used for cattle and horses. Heavily grazed. Grasses no taller than 1 inch. 26 inches of precipitation over the last 4 months. No indication the stream has topped its banks.	

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> X Geomorphic Position (D2)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Aquatic Fauna (B13)		<input checked="" type="checkbox"/> X Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes <u>X</u> No _____
Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:		
Remarks: No indication of stream banks being topped.		

VEGETATION (Five Strata) -- Use Scientific Names of plants.

Sampling Point: DP-2

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status															
1. <i>Juglans nigra</i>	20	Y	FACU	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)														
2. <i>Fraxinus pennsylvanica</i>	5	N	FACW															
3. <i>Platanus occidentalis</i>	5	N	FACW															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
30 = Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x1= <u>0</u></td> </tr> <tr> <td>FACW species <u>15</u></td> <td>x2= <u>30</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x3= <u>0</u></td> </tr> <tr> <td>FACU species <u>75</u></td> <td>x4= <u>300</u></td> </tr> <tr> <td>UPL species <u>25</u></td> <td>x5= <u>125</u></td> </tr> <tr> <td>Column Totals: <u>115</u> (A)</td> <td><u>455</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>4.0</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x1= <u>0</u>	FACW species <u>15</u>	x2= <u>30</u>	FAC species <u>0</u>	x3= <u>0</u>	FACU species <u>75</u>	x4= <u>300</u>	UPL species <u>25</u>	x5= <u>125</u>	Column Totals: <u>115</u> (A)	<u>455</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x1= <u>0</u>																	
FACW species <u>15</u>	x2= <u>30</u>																	
FAC species <u>0</u>	x3= <u>0</u>																	
FACU species <u>75</u>	x4= <u>300</u>																	
UPL species <u>25</u>	x5= <u>125</u>																	
Column Totals: <u>115</u> (A)	<u>455</u> (B)																	
50% of total cover: <u>15</u>			20% of total cover: <u>6</u>															
Sapling Stratum (Plot Size: _____)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
0 = Total Cover																		
50% of total cover: <u>0</u>			20% of total cover: <u>0</u>															
Shrub Stratum (Plot Size: _____)																		
1. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is $\leq 3.0^1$ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
0 = Total Cover																		
50% of total cover: <u>0</u>			20% of total cover: <u>0</u>															
Herb Stratum (Plot Size: 30')																		
1. <i>Schedonorus arundinaceus</i>	50	Y	FACU	¹ Indicators of hydric soils and wetland hydrology must be present, unless disturbed or problematic.														
2. <i>Plantago lanceolata</i>	20	Y	UPL															
3. <i>Stellaria media</i>	5	N	UPL															
4. <i>Persicaria maculosa</i>	5	N	FACW															
5. <i>Solanum carolinense</i>	5	N	FACU															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
85 = Total Cover				Definitions of Vegetation Strata: Tree -- Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height. Sapling -- Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub -- Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb -- All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine -- All woody vines, regardless of height.														
50% of total cover: <u>42.5</u>			20% of total cover: <u>17</u>															
Woody Vine Stratum (Plot size: _____)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
0 = Total Cover																		
50% of total cover: <u>0</u>			20% of total cover: <u>0</u>															
Remarks: (Include photo numbers here or on a separate sheet.) <i>Impatiens capensis</i> and <i>Pilea pumila</i> along stream bank slope. No indication observed that they are growing within open field.																		

SOIL

Sampling Point: DP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16	10YR 5/3	100						No redox observed
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.							² Location: PL=Pore Lining, M=Matrix	

Hydric Soil Indicators:

☐ Histisol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ 2 cm Muck (A10) (**LRR N**)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1)(**LRR N, MLRA 147, 148**)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)

☐ Dark Surface (S7)
☐ Polyvalue Below Dark Surface (S8)(**MLRA 147, 148**)
☐ Thin Dark Surface (S9)(**MLRA 147, 148**)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Iron-Manganese Masses (F12)(**LRR N, MLRA 136**)
☐ Umbric Surface (F13)(**MLRA 136, 122**)
☐ Piedmont Floodplain Soils (F19)(**MLRA 148**)
☐ Red Parent Material (F21)(**MLRA 127, 147**)

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10)(**MLRA 147**)
☐ Coast Prairie Redox (A16)(**MLRA 147, 148**)
☐ Piedmont Floodplain Soils (F19)(**MLRA 136, 147**)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soils Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM -- Eastern Mountains and Piedmont Region

Project/Site: Halfway Boulevard Extended City/County: Washington Sampling Date: 9/20/18
 Applicant/Owner: Washington County State: MD Sampling Point: DP-3
 Investigator(s): SDA, JAM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): _____
 Subregion (LRR or MLRA): 147 S Lat: 39.641622 Long: -77.804060 Datum: _____
 Soil Map Unit Name: Melvin silt loam NWI classification: Upland
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
 Are Vegetation X, Soil X, or hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation _____, Soil _____, or hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: 26 inches of rainfall over the last 4 months. Wetland characteristics are located within an active farmfield that will be purchased for deve	

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Sediment Deposits (B2)	<input checked="" type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input checked="" type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Iron Deposits (B5)		<input checked="" type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Aquatic Fauna (B13)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>0.05</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)		Wetland Hydrology Present? Yes <u>X</u> No _____	
Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

VEGETATION (Five Strata) -- Use Scientific Names of plants.

Sampling Point: DP-3

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC <u>0</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x1= <u>0</u></td> </tr> <tr> <td>FACW species <u>10</u></td> <td>x2= <u>20</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x3= <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x4= <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x5= <u>0</u></td> </tr> <tr> <td>Column Totals: <u>10</u> (A)</td> <td><u>20</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.0</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x1= <u>0</u>	FACW species <u>10</u>	x2= <u>20</u>	FAC species <u>0</u>	x3= <u>0</u>	FACU species <u>0</u>	x4= <u>0</u>	UPL species <u>0</u>	x5= <u>0</u>	Column Totals: <u>10</u> (A)	<u>20</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x1= <u>0</u>																	
FACW species <u>10</u>	x2= <u>20</u>																	
FAC species <u>0</u>	x3= <u>0</u>																	
FACU species <u>0</u>	x4= <u>0</u>																	
UPL species <u>0</u>	x5= <u>0</u>																	
Column Totals: <u>10</u> (A)	<u>20</u> (B)																	
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>																
Sapling Stratum (Plot Size: _____)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
_____ = Total Cover																		
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>																
Shrub Stratum (Plot Size: _____)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
_____ = Total Cover																		
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>																
Herb Stratum (Plot Size: <u>30'</u>)																		
1. <i>Glycine</i> sp.	60	Y	NI															
2. <i>Cyperus strigosus</i>	10	N	FACW															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
_____ = Total Cover																		
50% of total cover: <u>35</u>		20% of total cover: <u>14</u>																
Woody Vine Stratum (Plot size: _____)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
_____ = Total Cover																		
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>																
Remarks: (Include photo numbers here or on a separate sheet.)																		

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
☒ 3 - Prevalence Index is ≤ 3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain) _____

¹Indicators of hydric soils and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
Tree -- Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height.
Sapling -- Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Shrub -- Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Herb -- All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody vine -- All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

SOIL Sampling Point: DP-3

SOIL Sampling Point: DP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
<ul style="list-style-type: none"> 1. Soil Temperature: Soil temperature at 5 cm depth is consistently below 10°C for 90 consecutive days or more during the growing season. 2. Soil Moisture: Soil moisture content is consistently above 15% for 90 consecutive days or more during the growing season. 3. Soil Color: Soil color is consistently dark gray or black for 90 consecutive days or more during the growing season. 4. Soil pH: Soil pH is consistently below 6.5 for 90 consecutive days or more during the growing season. 5. Soil Texture: Soil texture is consistently silty clay or clay for 90 consecutive days or more during the growing season. 6. Soil Structure: Soil structure is consistently poor or very poor for 90 consecutive days or more during the growing season. 7. Soil Compaction: Soil compaction is consistently high for 90 consecutive days or more during the growing season. 8. Soil Salinity: Soil salinity is consistently above 4 dS/m for 90 consecutive days or more during the growing season. 9. Soil Sulfides: Soil sulfides are consistently present for 90 consecutive days or more during the growing season. 10. Soil Odor: Soil odor is consistently strong or very strong for 90 consecutive days or more during the growing season. 11. Soil Gas: Soil gas is consistently high for 90 consecutive days or more during the growing season. 12. Soil Microbiology: Soil microbiology is consistently high for 90 consecutive days or more during the growing season. 13. Soil Plant Growth: Soil plant growth is consistently poor or very poor for 90 consecutive days or more during the growing season. 14. Soil Animal Life: Soil animal life is consistently high for 90 consecutive days or more during the growing season. 15. Soil Nutrient Levels: Soil nutrient levels are consistently high for 90 consecutive days or more during the growing season. 	<ul style="list-style-type: none"> 1. Soil Temperature: Soil temperature at 5 cm depth is consistently below 10°C for 90 consecutive days or more during the growing season. 2. Soil Moisture: Soil moisture content is consistently above 15% for 90 consecutive days or more during the growing season. 3. Soil Color: Soil color is consistently dark gray or black for 90 consecutive days or more during the growing season. 4. Soil pH: Soil pH is consistently below 6.5 for 90 consecutive days or more during the growing season. 5. Soil Texture: Soil texture is consistently silty clay or clay for 90 consecutive days or more during the growing season. 6. Soil Structure: Soil structure is consistently poor or very poor for 90 consecutive days or more during the growing season. 7. Soil Compaction: Soil compaction is consistently high for 90 consecutive days or more during the growing season. 8. Soil Salinity: Soil salinity is consistently above 4 dS/m for 90 consecutive days or more during the growing season. 9. Soil Sulfides: Soil sulfides are consistently present for 90 consecutive days or more during the growing season. 10. Soil Odor: Soil odor is consistently strong or very strong for 90 consecutive days or more during the growing season. 11. Soil Gas: Soil gas is consistently high for 90 consecutive days or more during the growing season. 12. Soil Microbiology: Soil microbiology is consistently high for 90 consecutive days or more during the growing season. 13. Soil Plant Growth: Soil plant growth is consistently poor or very poor for 90 consecutive days or more during the growing season. 14. Soil Animal Life: Soil animal life is consistently high for 90 consecutive days or more during the growing season. 15. Soil Nutrient Levels: Soil nutrient levels are consistently high for 90 consecutive days or more during the growing season.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
<ul style="list-style-type: none"> 1. Soil Temperature: Soil temperature at 5 cm depth is consistently below 10°C for 90 consecutive days or more during the growing season. 2. Soil Moisture: Soil moisture content is consistently above 15% for 90 consecutive days or more during the growing season. 3. Soil Color: Soil color is consistently dark gray or black for 90 consecutive days or more during the growing season. 4. Soil pH: Soil pH is consistently below 6.5 for 90 consecutive days or more during the growing season. 5. Soil Texture: Soil texture is consistently silty clay or clay for 90 consecutive days or more during the growing season. 6. Soil Structure: Soil structure is consistently poor or very poor for 90 consecutive days or more during the growing season. 7. Soil Compaction: Soil compaction is consistently high for 90 consecutive days or more during the growing season. 8. Soil Salinity: Soil salinity is consistently above 4 dS/m for 90 consecutive days or more during the growing season. 9. Soil Sulfides: Soil sulfides are consistently present for 90 consecutive days or more during the growing season. 10. Soil Odor: Soil odor is consistently strong or very strong for 90 consecutive days or more during the growing season. 11. Soil Gas: Soil gas is consistently high for 90 consecutive days or more during the growing season. 12. Soil Microbiology: Soil microbiology is consistently high for 90 consecutive days or more during the growing season. 13. Soil Plant Growth: Soil plant growth is consistently poor or very poor for 90 consecutive days or more during the growing season. 14. Soil Animal Life: Soil animal life is consistently high for 90 consecutive days or more during the growing season. 15. Soil Nutrient Levels: Soil nutrient levels are consistently high for 90 consecutive days or more during the growing season. 	<ul style="list-style-type: none"> 1. Soil Temperature: Soil temperature at 5 cm depth is consistently below 10°C for 90 consecutive days or more during the growing season. 2. Soil Moisture: Soil moisture content is consistently above 15% for 90 consecutive days or more during the growing season. 3. Soil Color: Soil color is consistently dark gray or black for 90 consecutive days or more during the growing season. 4. Soil pH: Soil pH is consistently below 6.5 for 90 consecutive days or more during the growing season. 5. Soil Texture: Soil texture is consistently silty clay or clay for 90 consecutive days or more during the growing season. 6. Soil Structure: Soil structure is consistently poor or very poor for 90 consecutive days or more during the growing season. 7. Soil Compaction: Soil compaction is consistently high for 90 consecutive days or more during the growing season. 8. Soil Salinity: Soil salinity is consistently above 4 dS/m for 90 consecutive days or more during the growing season. 9. Soil Sulfides: Soil sulfides are consistently present for 90 consecutive days or more during the growing season. 10. Soil Odor: Soil odor is consistently strong or very strong for 90 consecutive days or more during the growing season. 11. Soil Gas: Soil gas is consistently high for 90 consecutive days or more during the growing season. 12. Soil Microbiology: Soil microbiology is consistently high for 90 consecutive days or more during the growing season. 13. Soil Plant Growth: Soil plant growth is consistently poor or very poor for 90 consecutive days or more during the growing season. 14. Soil Animal Life: Soil animal life is consistently high for 90 consecutive days or more during the growing season. 15. Soil Nutrient Levels: Soil nutrient levels are consistently high for 90 consecutive days or more during the growing season.

<input type="checkbox"/> Histisol (A1)	<input checked="" type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10)(MLRA 147)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Dark Surface (S8)(MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)(MLRA 147, 148)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)(MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)(MLRA 136, 147)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)(LRR N, MLRA 147, 148)	<input checked="" type="checkbox"/> Iron-Manganese Masses (F12)(LRR N, MLRA 136)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13)(MLRA 136, 122)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)(MLRA 148)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (F21)(MLRA 127, 147)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

___ Histisol (A1)	<u>X</u> Dark Surface (S7)	___ 2 cm Muck (A10)(MLRA 147)
___ Histic Epipedon (A2)	___ Polyvalue Below Dark Surface (S8)(MLRA 147, 148)	___ Coast Prairie Redox (A16)
___ Black Histic (A3)		___ (MLRA 147, 148)
___ Hydrogen Sulfide (A4)	___ Thin Dark Surface (S9)(MLRA 147, 148)	___ Piedmont Floodplain Soils (F19)
___ Stratified Layers (A5)	___ Loamy Gleyed Matrix (F2)	___ (MLRA 136, 147)
___ 2 cm Muck (A10) (LRR N)	___ Depleted Matrix (F3)	___ Very Shallow Dark Surface (TF12)
___ Depleted Below Dark Surface (A11)	___ Redox Dark Surface (F6)	___ Other (Explain in Remarks)

Sandy Mucky Mineral (S1)(LRR N, MLRA 147, 148)	Redox Depressions (F8)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
Sandy Gleyed Matrix (S4)	X Iron-Manganese Masses (F12)(LRR N, MLRA 136)	

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ☒ No

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ☒ No

Remarks:

WETLAND DETERMINATION DATA FORM -- Eastern Mountains and Piedmont Region

Project/Site: Halfway Boulevard Extended City/County: Washington Sampling Date: 9/20/18
 Applicant/Owner: Washington County State: MD Sampling Point: DP-4
 Investigator(s): SDA, JAM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat farm field Local relief (concave, convex, none): None Slope (%): _____
 Subregion (LRR or MLRA): 147 S Lat: 39.641611 Long: -77.804386 Datum: _____
 Soil Map Unit Name: Melvin silt loam NWI classification: UPL
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
 Are Vegetation X, Soil X, or hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation _____, Soil _____, or hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks: 26 inches of rainfall over the last 4 months. Data point located within an active farm field that will be developed.	

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Aquatic Fauna (B13)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes _____ No <u>X</u>
Describe Recorded Data (stream guage, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION (Five Strata) -- Use Scientific Names of plants.

Sampling Point: DP-4

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status																													
1. _____	_____	_____	_____	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC <u>0</u> (A/B)																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
0 = Total Cover																																
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>																														
Sapling Stratum (Plot Size: _____)				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td colspan="2">Total % Cover of:</td> <td colspan="2">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x1=</td> <td><u>0</u></td> </tr> <tr> <td>FACW species</td> <td><u>0</u></td> <td>x2=</td> <td><u>0</u></td> </tr> <tr> <td>FAC species</td> <td><u>0</u></td> <td>x3=</td> <td><u>0</u></td> </tr> <tr> <td>FACU species</td> <td><u>0</u></td> <td>x4=</td> <td><u>0</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x5=</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>0</u> (A)</td> <td></td> <td><u>0</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>####</u>	Total % Cover of:		Multiply by:		OBL species	<u>0</u>	x1=	<u>0</u>	FACW species	<u>0</u>	x2=	<u>0</u>	FAC species	<u>0</u>	x3=	<u>0</u>	FACU species	<u>0</u>	x4=	<u>0</u>	UPL species	<u>0</u>	x5=	<u>0</u>	Column Totals:	<u>0</u> (A)		<u>0</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>0</u>	x1=	<u>0</u>																													
FACW species	<u>0</u>	x2=	<u>0</u>																													
FAC species	<u>0</u>	x3=	<u>0</u>																													
FACU species	<u>0</u>	x4=	<u>0</u>																													
UPL species	<u>0</u>	x5=	<u>0</u>																													
Column Totals:	<u>0</u> (A)		<u>0</u> (B)																													
1. _____	_____	_____	_____																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
0 = Total Cover																																
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>																														
Shrub Stratum (Plot Size: <u>30'</u>)				Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is $\leq 3.0^1$ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain)																												
1. <i>Glycine</i> sp.	70	Y	NI																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
70 = Total Cover																																
50% of total cover: <u>35</u>		20% of total cover: <u>14</u>																														
Herb Stratum (Plot Size: _____)				Definitions of Vegetation Strata: Tree -- Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height. Sapling -- Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub -- Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb -- All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine -- All woody vines, regardless of height.																												
1. _____	_____	_____	_____																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
7. _____	_____	_____	_____																													
8. _____	_____	_____	_____																													
9. _____	_____	_____	_____																													
10. _____	_____	_____	_____																													
11. _____	_____	_____	_____																													
0 = Total Cover																																
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>																														
Woody Vine Stratum (Plot size: _____)				Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u>																												
1. _____	_____	_____	_____																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
0 = Total Cover																																
50% of total cover: <u>0</u>		20% of total cover: <u>0</u>																														
Remarks: (Include photo numbers here or on a separate sheet.) Active farm field has soybeans present.																																

SOIL

Sampling Point: DP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16	7.5YR 4/3	100					Clay loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators:**

☐ Histisol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ 2 cm Muck (A10) (**LRR N**)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1)(**LRR N**,
MLRA 147, 148)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)

☐ Dark Surface (S7)
☐ Polyvalue Below Dark Surface (S8)(**MLRA 147, 148**)
☐ Thin Dark Surface (S9)(**MLRA 147, 148**)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Iron-Manganese Masses (F12)(**LRR N**,
MLRA 136)
☐ Umbric Surface (F13)(**MLRA 136, 122**)
☐ Piedmont Floodplain Soils (F19)(**MLRA 148**)
☐ Red Parent Material (F21)(**MLRA 127, 147**)

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10)(**MLRA 147**)
☐ Coast Prairie Redox (A16)
(MLRA 147, 148)
☐ Piedmont Floodplain Soils (F19)
(MLRA 136, 147)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soils Present? Yes ____ No X**Remarks:**

Frequently tilled soils from farming.

APPENDIX C
PHOTOGRAPHS



Photo 1: WW1 (Unnamed Tributary to Conococheague Creek) facing southwest at culvert crossing.



Photo 2: WW1 (Unnamed Tributary to Conococheague Creek) looking downstream at culvert crossing.



Photo 3: WW2 facing downstream from WET 1, within farm field.



Photo 4: WW2 looking upstream (northwest); WET1 abutting stream to the west.



Photo 5: Standing at farm road facing WW2 at 90° channel bend.



Photo 6: Upstream extent of WW2 at property boundary. WET1 (left) abuts WW2.



Photo 7: WW2 facing upstream at confluence with WW1.



Photo 8: WW2 facing downstream at confluence with WW1.



Photo 9: Portion of soil profile at DP-2 (10YR 5/3, no redox observed).



Photo 10: Portion of soil profile at DP-1 (10YR 5/3, no redox observed, wetter sample than DP-2).

TYPE I TECHNICAL NOISE ANALYSIS HALFWAY BOULEVARD EXTENDED

Washington County, Maryland

October 2018



Executive Summary

The Halfway Boulevard Extension project is located within Washington County, west of Hagerstown, MD. The limits of the project extend from the existing terminus of Halfway Boulevard approximately 2,800 feet to the west. Planned private development will construct the remaining portion of Halfway Extended to the Greencastle Pike intersection, including the intersection improvements.

Halfway Boulevard is proposed to be a four-lane minor arterial with 120 feet of right-of-way. The paved road section will be 82 feet wide consisting of two twelve foot-lanes in each direction, with an eighteen-foot grass median/center left turn lane, and eight foot wide shoulders. The new roadway section shall match the existing cross section from Interstate 81 to New Gate Boulevard. The roadway project will also include the construction of a culvert over an unnamed tributary of Conococheague Creek. This will be an open section roadway with bio-swales, grass swales, and pervious concrete sidewalk.

The land uses associated with this project are primarily undeveloped, not permitted plots of land, as well as some commercial with the exception of a single-family home north of the Greencastle Pike and Business Parkway.

In accordance with the Code of Federal Regulations, and as defined in the Maryland Department of Transportation's State Highway Administration Noise Policy, an area is considered impacted when a sound level approaches or exceeds 66 dB(A) for residences, and 71 dB(A) for restaurants and businesses with outdoor use areas. For this project, predicted sound levels of the NSAs do not exceed the impacted sound level criteria, therefore, ***the NSAs do not warrant investigation of noise abatement.***

Although no formal noise abatement is mandatory for this phase of development, noise-compatible planning measures are recommended to account for likely future expansion. These voluntary measures may include avoidance through design practices, developer noise barriers, berms, landscaping, or strategic orientation of building features. For example, balconies and patios located with the building structure between the outdoor space and the roadway will receive some shielding from the building itself. Locating less noise sensitive structures closest to the roadway will provide a buffer for the more sensitive uses. Likewise, locating bedrooms or other noise sensitive indoor spaces on the side of the structure furthest from the roadway will improve the experience of the end user. Some of these methods can also be used as cost cutting measures, such as using excess fill as a visual berm that will provide some shielding from tire noise as an alternative to paying disposal costs.

Table of Contents

Section 1 – Introduction

Introduction	1-1
Existing Conditions	1-1
Proposed Conditions	1-1
Land Use Descriptions	1-2
Highway Noise Fundamentals	1-4
Federal Noise Abatement Criteria	1-6

Section 2 – Sound Measurements and Noise Analysis

Introduction	2-1
Sound Measurement Data	2-1
TNM Model Validation	2-2
TNM Model Traffic	2-3
TNM Model Results	2-5
Impact Analysis	2-5
Undeveloped Lands Noise Level Documentation	2-7
Conclusions and Recommendations	2-8

Figures

Figure 1 – Project Limits	after 1-6
Figure 2 – Land Use Area Map	after 2-8
Figure 3 – Validation Results Map	after 2-8
Figure 4 – Impact Analysis Map	after 2-8

Tables

Table 1.A – Common Outdoor and Indoor Noise Levels	1-5
Table 1.B – Noise Abatement Criteria Hourly A-Weighted Sound Level in Decibels (dB[A])	1-6
Table 2.A – Sound Measurement Location	2-1
Table 2.B – Measured Receptor TNM Validation	2-2
Table 2.C – Existing Traffic Volume Summary –Traffic Noise Model	2-3
Table 2.D – 2045 Design Hour (DHV) Traffic Volume Summary	2-4
Table 2.E –TNM Analysis Results	2-5
Table 2.F – Land Use Activity Category G Area Distances	2-7

Appendices

Sound Measurement Data	Appendix A
------------------------	------------

TRAFFIC NOISE ANALYSIS HALFWAY BOULEVARD EXTENDED

Section 1 Introduction

October 2018

Traffic Noise Analysis – Halfway Boulevard Extended

Section 1: Introduction

Introduction

The Halfway Boulevard Extended roadway project is located within Washington County, west of Hagerstown, MD. The limits of the project extend from the existing terminus of Halfway Boulevard approximately 2,800 feet to the west. Planned private development will construct the remaining portion of Halfway Extended to the Greencastle Pike intersection, including any intersection improvements.

The Federal Highway Administration's (FHWA) Traffic Noise Model (TNM) v2.5 was used to develop the existing conditions model and to predict future sound levels for this intersection.

The purpose of this traffic noise analysis is to determine if the Noise Sensitive Areas (NSAs) will be impacted by traffic noise in the 2045 proposed build condition. This report presents the results of this traffic noise analysis completed for this Halfway Boulevard Extended project area.

Existing Conditions

The existing portion of Halfway Boulevard within the project area is a four lane roadway that extends north and west from the intersection with Hopewell Road, ending at New Gate Boulevard. This existing roadway provides access to a number of businesses and industries, including a FedEx Ground facility, and a series of distribution complexes. Primarily, the roadway consists of four 12-foot travel lanes with paved shoulders separated by an eighteen foot grass median. The posted speed limit on Halfway Boulevard is 40 MPH; radar measurements indicate traffic moves approximately 34 to 50 MPH. The variation in speed may be due to the combination of elevation of the roadway and speed limitations of trucks traveling up hill. There are no residential properties that currently have direct driveway access to Halfway Boulevard.

Proposed Conditions

The study area for the proposed improvements extend from the existing terminus of Halfway Boulevard approximately 2,800 feet to the west. Planned private development will construct the remaining portion of Halfway Extended to the Greencastle Pike intersection, including any intersection improvements, as shown in Figure 1. The roadway is proposed to be a four-lane minor arterial with 120 feet of right-of-way. The paved road section will be 82 feet wide consisting of two twelve foot-lanes in each direction, with an eighteen foot grass median/center left turn lane, and eight foot wide shoulders. The new roadway section shall match the existing cross section from Interstate 81 to New Gate Boulevard. The roadway project will also include the construction of a culvert over an unnamed tributary of Conococheague Creek. This will be an open section roadway with bio-swales, grass swales, and pervious concrete sidewalk.

The parcel that includes the extension is currently zoned commercial. The long-term planned land development strategy for the area as a whole includes the extension of Halfway Boulevard to Greencastle Pike which will allow access points for various planned private development projects.

Traffic Noise Analysis – Halfway Boulevard Extended

Section 1: Introduction

Land Use Descriptions

The study area was divided into 12 distinct areas of land use in accordance with Maryland Department of Transportation's State Highway Administration (MDOT SHA) and Federal Highway Administration's (FHWA) policies and guidance. Of these, 2 were identified as Noise Sensitive Areas (NSAs) and 10 were identified as non-noise sensitive. Figure 2 depicts the various land uses within the project limits.

The NSAs were defined by their corresponding FHWA land use activity category where the category letter is added to the end of the NSA designation (e.g. 01-E, 04-B, and 08-E). Three NSAs were determined to be Category B (residential). According to 23 CFR 772, Category F and G areas are considered non-sensitive land use areas.

A description of each NSA and non-sensitive land use area is listed below. The NSAs with a dark gray colored font required no further consideration beyond identifying their use:

Noise Sensitive Areas

01-B

This NSA represents a single family residence along the southbound lane of Greencastle Pike with driveway access. This residence is about 500' north of the proposed alignment and intersection of Halfway Boulevard and Greencastle Pike.

02-E

This NSA represents a strip of businesses that includes a Portrait Studio, a construction office, MDOT SHA office, and a hair salon. There is no apparent outdoor noise sensitive use of "sufficient frequency and duration".

Non-Noise Sensitive Land Uses

F-01

This land owned by Martin and Ann Reichard is zoned for agricultural use.

F-02

This area represents AmeriClean Carpet and Upholstery Cleaning owned by Ellis Holdings LLC. This property is zoned for industrial use.

G-03

This area represents an undeveloped parcel of land owned by 2005 Greencastle Pike LLC. This property is zoned for commercial use.

Traffic Noise Analysis – Halfway Boulevard Extended

Section 1: Introduction

F-04

This area represents Baltimore Truck Center owned by Greencastle Pike Property LLC. This property is zoned for industrial use.

G-05

This area represents an undeveloped parcel of land owned by Washington County Commissioners Board.

G-06

This area represents the land area that the proposed Halfway Boulevard extension will bisect. The parcel in its entirety is currently zoned commercial; however, at the time of field verification, there were three single family homes within this parcel that displayed evidence of active use. The property is owned by Bowman 2000 LLC.

F-07

This area represents a sewer pump station owned by the Washington County Commissioners Board and is zoned as exempt commercial.

G-08

This area represents an undeveloped parcel of land owned by FedEx, zoned for industrial use.

F-09

This area represents a FedEx Ground complex owned by FedEx Ground Package System Inc. This property is zoned for industrial use.

G-10

This area represents an undeveloped parcel of land which includes a waste water facility managing run-off from the neighboring FedEx Ground complex and is owned by FedEx Ground Package System Inc. This property is zoned for commercial use.

Traffic Noise Analysis – Halfway Boulevard Extended

Section 1: Introduction

Highway Noise Fundamentals

The definition of noise is any unwanted or excessive sound. A discussion on highway noise fundamentals is included, because it helps define many of the terms and criteria used in the report.

The extent to which individuals are affected by noise sources is controlled by several factors, including:

- Duration and frequency of sound
- Distance between the sound source and the receptor
- Intervening natural or manmade barriers or structures
- Ambient noise environment

The level of highway traffic noise depends primarily upon the following:

- Volume of traffic
- Speed of traffic
- Number of heavy duty trucks in the flow of traffic

Generally, traffic noise is increased by heavier traffic volumes, higher speeds, and greater numbers of trucks. Consequently, FHWA has established the following vehicle categories to use in traffic noise analysis:

- Heavy-duty trucks, defined as vehicles having three or more axles
- Medium-duty trucks, defined as vehicles with two axles and six wheels
- Automobiles, defined as vehicles with two axles and four wheels
- Buses
- Motorcycles

Heavy-duty trucks typically produce more noise than medium-duty trucks traveling at the same speed. Medium duty trucks, in turn, typically generate more noise than automobiles.

Traffic noise is measured and described according to FHWA guidelines, which prescribe the use of the hourly equivalent sound level ($L_{eq}[h]$) as the primary descriptor for noise analysis. $L_{eq}(h)$ is defined as the equivalent steady state sound level, which in one hour contains the same acoustic energy as the time-varying sound level during the same one-hour period.

The unit of measure for the L_{eq} is the “A-weighted” decibel (dB[A]). The dB(A) scale de-emphasizes the very low and very high frequencies and emphasizes the middle frequencies, thereby closely approximating the frequency response of the human ear. TABLE 1.A provides examples of common outdoor noise levels and their respective noise level decibels, as well as some common noise sources found indoors that produce equivalent noise levels.

Traffic Noise Analysis – Halfway Boulevard Extended

Section 1: Introduction

TABLE 1.A Common Outdoor And Indoor Noise Levels¹		
Common Outdoor Noise Levels	Noise Level Decibels	Common Indoor Noise Levels
	110	Rock Band at 16 feet
Jet Fly Over at 1,000 feet	100	Inside Subway Train (NY)
Gas Lawn Mower at 3 feet	95	
	90	Food Blender at 3 feet
Diesel Truck at 50 feet	85	
Noisy Urban Daytime	80	Garbage Disposal at 3 feet
	75	Shouting at 3 feet
Gas Lawn Mower at 100 feet	70	Vacuum Cleaner at 10 feet
Commercial Area	65	Normal Speech at 3 feet
	60	
Quiet Urban Daytime	55	Quiet Conversation at 3 feet
	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Small Theater, Large Conference Room
Quiet Suburban Nighttime	35	Library
	30	Bedroom at Night
Quiet Rural Nighttime	25	Concert Hall (Empty)
Rustling Leaves	20	
	15	Broadcast & Recording Studio
Reference Pressure Level	0	Threshold of Hearing
1. Adapted from <i>Guide on Evaluation and Attenuation of Traffic Noise</i> , AASHTO-1974.		

Typically, sound level changes of 3 dB(A) are barely perceptible, while a change of 5 dB(A) is readily noticeable by most people. A 10 dB(A) increase is usually perceived as a doubling of loudness. Conversely, noise is perceived to be reduced by one-half when a sound level is reduced by 10 dB(A).

Federal Noise Abatement Criteria

Noise impacts are determined in accordance with FHWA guidelines as established by 23 CFR, Part 772, which became effective July 13, 2011. The Federal Noise Abatement Criteria (NAC) provided in TABLE 1.B are based on specific land uses and are used in determining the need for studying noise attenuation measures.

Traffic Noise Analysis – Halfway Boulevard Extended

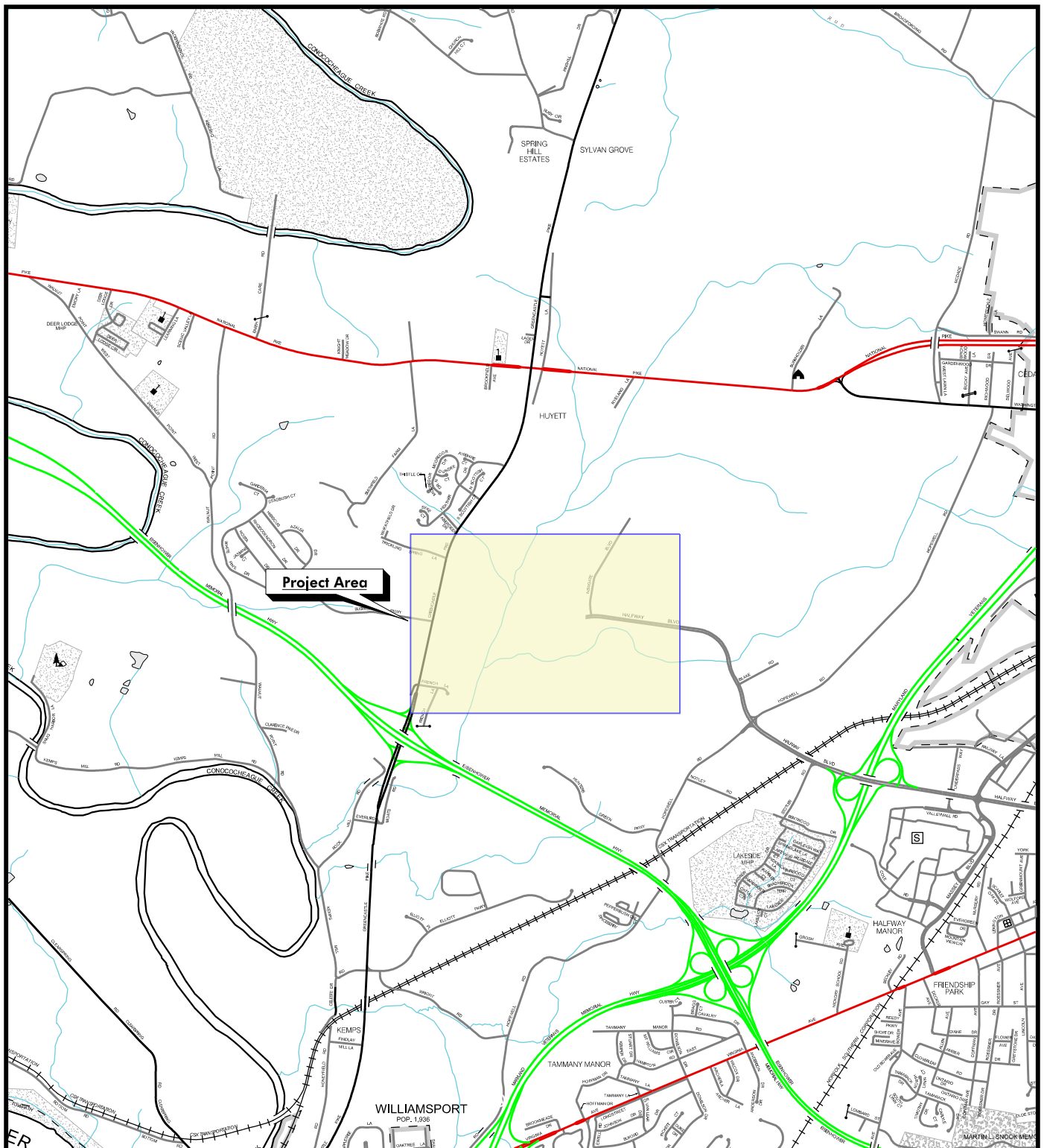
Section 1: Introduction

TABLE 1.B Noise Abatement Criteria (NAC) Hourly A-Weighted Sound Level in Decibels (dB[A])¹

Activity Category	Activity Leq(h)	Criteria L ₁₀ (h) ²	Description of Activity Category
A	57 (Exterior)	60 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	70 (Exterior)	Residential.
C	67 (Exterior)	70 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	55 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (Exterior)	75 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	-	-	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	-	-	Undeveloped lands that are not permitted.
¹ Either Leq(h) or L ₁₀ (h) (but not both) may be used on a project.			
² The Leq(h) and L ₁₀ (h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.			
Source: FHWA 23 CFR 772 Table 1			

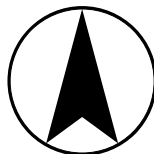
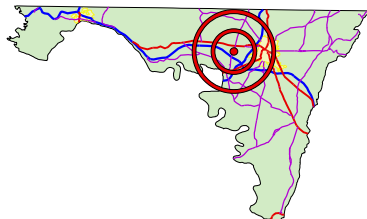
Per the FHWA NAC, a property is considered “impacted” when traffic noise approaches or exceeds the aforementioned noise impact level in areas of frequent human use. In defining the term “approaches,” the Maryland Department of Transportation State Highway Administration Highway Noise Policy, effective July 13, 2011 and revised August 31, 2011, states that noise impacts occur when the sound level approaches the NAC within 1 dB(A).

The Halfway Boulevard Extended project study area mainly includes a single-family residence, industrial, commercial and agricultural properties, and undeveloped land; or Activity Categories B, E, F and G. The category B land uses have a noise impact criterion of 66 dB(A); the category E areas with an associated outdoor use have an impact criterion of 71 dB(A). The category F and G areas are not considered noise sensitive and are included only for reference purposes.



Project Area

Washington County Vicinity Map



0 3000
Scale in Feet

October 2018

Washington County
Maryland

Division of Engineering

Construction Management

Wallace Montgomery

Halfway Boulevard Extension Technical Noise Analysis Report

Washington County

Halfway Boulevard Extended
to Greencastle Pike (MD 63)

Project Limits

Figure 1

TRAFFIC NOISE ANALYSIS HALFWAY BOULEVARD EXTENDED

Section 2 Sound Measurements and Noise Analysis

October 2018

Traffic Noise Analysis – Halfway Boulevard Extended

Section 2: Sound Measurements and Analysis

Introduction

This study was conducted to analyze the 2045 proposed sound levels in the Halfway Boulevard Extended study area which includes the extension of Halfway Boulevard 2,800 feet to the west.

A study of existing conditions was completed and then modeled in FHWA's TNM v2.5. Existing sound levels were measured and simultaneous traffic data was collected. The traffic data was input into the TNM validation models and the sound level results output from the model were compared to the measured sound levels. If the TNM output was within ± 3 dB(A) of the measured sound levels, then the TNM model was considered validated in accordance with FHWA and MDOT SHA. The proposed condition TNM model was evaluated using 2045 traffic data provided by Washington County. The proposed condition TNM model included the extension of Halfway Boulevard to the intersection of Greencastle Pike and Business Parkway. In addition to the eight measured receptors, fifty three receptors were added to the future prediction models in order to accurately determine the future sound level of those locations.

Sound Measurement Data

Sound measurements were performed in conformance with the U.S. Department of Transportation FHWA's Measurement of Highway-Related Noise (FHWA-PD-96-046 May 1996).

Eight sound measurements were taken September 7, 2018, during four traffic monitoring sessions (TMS). TABLE 2.A details the measurement location, the duration of the test, and the NAC Activity Category. The related data, figures, and tables for each receptor can be seen in Appendix A.

TABLE 2.A Sound Measurement Location							
Receptor Number	Location		NAC Activity Category	Date	TMS Session	Interval	Measured Sound Level ¹
M-01		Greencastle Pike	G	09/07/2018	01	10:10-10:30	59
M-02	11818	Greencastle Pike	B	09/07/2018	01	10:10-10:30	60
M-03	11818	Greencastle Pike	B	09/06/2018	24hr	9:00-9:00	-
M-04	11818	Greencastle Pike	B	09/07/2018	03	11:25-11:45	65
M-05	10228	Greencastle Pike	G	09/07/2018	03	11:25-11:45	57
M-06	11901	Greencastle Pike	G	09/07/2018	02	10:45-11:05	47
M-07	11901	Greencastle Pike	G	09/07/2018	02	10:45-11:05	46
M-08	11901	Greencastle Pike	G	09/06/2018	24hr	9:00-9:00	-
M-09		New Gate Boulevard	G	09/07/2018	04	12:20-12:40	70
M-10	11901	Greencastle Pike	G	09/07/2018	04	12:20-12:40	48
Total Number of Short-term Sound Measurements							8
1. All Sound Levels are shown as hourly equivalent sound levels (Leq[h]) with units in A-weighted decibels (dB[A]).							

Traffic Noise Analysis – Halfway Boulevard Extended

Section 2: Sound Measurements and Analysis

TNM Model Validation

A TNM Model was developed for the study area, inputting all roadways, terrain, ground zones, and structural elements needed to adequately characterize the study area's noise environment. For the purposes of this analysis, all of the roadway surfaces were input into the model as "Average" to replicate and model existing field conditions, as per FHWA guidelines. As long as no further modifications are made to terrain or structural features, the model will predict valid sound levels at those receptors under any proposed condition.

The same validation model was run four separate times – one run for each TMS session with the respective traffic data. Table 2.B below summarizes the results. The location of each receptor site is shown on Figure 3.

TABLE 2.B Measured Receptor TNM Validation								
Receptor Number	Location		TMS Session	Measured Sound Level ¹	TNM Validation Sound Level ¹	Difference in Sound Level ¹	Validating Model Point? (Yes) or (No)	
M-01		Greencastle Pike	01	59	59.2	+0.2	Yes	
M-02	11818	Greencastle Pike	01	60	59.7	-0.3	Yes	
M-03	11818	Greencastle Pike	24hr	-	-	-	-	-
M-04 ²	11818	Greencastle Pike	03	70	65.1	-4.9		No
M-05	10228	Greencastle Pike	03	58	56.8	-1.2	Yes	
M-06	11901	Greencastle Pike	02	47	44.1	-2.9	Yes	
M-07	11901	Greencastle Pike	02	46	48.6	+2.6	Yes	
M-08	11901	Greencastle Pike	24hr	-	-	-	-	-
M-09 ³		New Gate Boulevard	04	70	42.5	-27.5		No
M-10	11901	Greencastle Pike	04	48	48.8	+0.8	Yes	
Total Number of Validating Short-term Sound Measurements								6
<small>1. All Sound Levels are shown as hourly equivalent sound levels (Leq[h]) with units in A-weighted decibels (dB[A]). 2. Meter failure. Receptor not used in validation. 3. Site development construction north of the project area. Receptor not used in validation.</small>								

Of the 6 validating receptors, 3 over-predict and 3 under-predict.

Figure 3, which follows page 2.8, depicts the TNM Model Validation for the entire project limits and shows the locations and measured vs. modeled noise levels of the receptor sites associated with this study.

Traffic Noise Analysis – Halfway Boulevard Extended

Section 2: Sound Measurements and Analysis

TNM Model Traffic

Validation Models - Existing traffic volumes and speeds were collected for Greencastle Pike, Business Parkway, New Gate Boulevard, and Halfway Boulevard. There were four sessions on September 7, 2018. The traffic and speed used for each validation model (as measured in the field) is located in TABLE 2.C.

TABLE 2.C Existing Traffic Volume Summary – Traffic Noise Model							
Roadway³	Autos (vph)¹	Medium Trucks (vph)¹	Heavy Trucks (vph)¹	Buses (vph)¹	Motor cycles (vph)¹	Total Volume (vph)¹	Speed (mph)²
TMS 01							
Greencastle Pike NB – North of Business Parkway	291	27	30	3	3	354	44
Greencastle Pike SB – North of Business Parkway	273	18	12	12	0	315	44
Greencastle Pike NB – South of Business Parkway	285	30	33	0	3	351	44
Greencastle Pike SB – South of Business Parkway	273	21	21	12	0	327	44
Business Parkway WB	42	3	6	3	0	54	30
Business Parkway EB	48	3	12	6	0	69	30
TMS 02							
Greencastle Pike NB	327	21	30	0	0	378	43
Greencastle Pike SB	339	24	33	12	0	408	47
TMS 03							
Greencastle Pike NB	522	339	0	33	3	567	33
Greencastle Pike SB	537	2712	3	6	0	573	34
TMS 04							
New Gate Boulevard NB	63	3	36	6	0	108	34
New Gate Boulevard SB	24	0	12	6	0	42	40
Halfway Boulevard WB - Lane 1	32	2	18	3	0	55	40
Halfway Boulevard WB - Lane 2	31	1	18	3	0	53	40
Halfway Boulevard EB – Lane 1	12	0	6	3	0	21	40
Halfway Boulevard EB – Lane 2	12	0	6	3	0	21	40
1. vph: Vehicles per hour 2. mph: Miles per hour 3. Lane directions (Left or Right) are designated from drivers left and right.							

Traffic Noise Analysis – Halfway Boulevard Extended

Section 2: Sound Measurements and Analysis

Existing Worst Case Model –The purpose of creating an Existing Worst Case model is to establish a uniform baseline that can be compared to the 2045 Build model noise levels at the same receptor locations to determine if the project produces a “significant increase” over existing noise levels as defined by Table 2 of the MDOT SHA Highway Noise Policy. Fifty-two modeled receptor locations, designated as R-11 through R-63 in the tables, were added to the Existing Worst Case model to create a detailed noise profile of the area directly adjacent to the proposed roadway extension; measured receptor noise levels were also re-run for this model prediction. The additional grid of receptors in the tables below were also included in the proposed model. 0700 peak hour traffic was used to represent the Existing Worst Case condition for all modeled receptors, as determined by the 24-hour noise measurement for loudest noise hour.

2045 Build Model –The 2045 Design Hour Volume (DHV) traffic data was calculated using a percentage growth rate of 1.5% provided by Washington County. The 1.5% was applied to the 0700 peak hour traffic taken from a 2016 Turning Movement Study of Halfway Boulevard at Hopewell Road and a 2017 Turning Movement Count Study of MD 63 at the entrance/exit to the Pilot Travel Center, and input into the TNM build conditions model. 2045 build traffic was included for both MD 63 and Halfway Boulevard Extended with the travel speeds equal to the assumed future speed of 45 and 40 mph respectively. The expected 2045 build traffic volumes for Halfway Boulevard, Greencastle Pike, Business Parkway, and New Gate Boulevard proposed conditions can be found in TABLE 2.D.

TABLE 2.D 2045 Design Hour (DHV) Traffic Volume Summary							
Roadway	Autos (vph)¹	Medium Trucks (vph)¹	Heavy Trucks (vph)¹	Buses (vph)¹	Motor cycles (vph)¹	Total Volume (vph)¹	Speed (mph)²
Business Parkway WB	157	11	22	11	0	202	30
Business Parkway EB	179	11	45	22	0	258	30
Greencastle Pike NB	1030	76	89	3	5	1203	45
Greencastle Pike SB	1656	110	110	55	0	1930	45
New Gate Boulevard NB	272	13	156	26	0	467	35
New Gate Boulevard SB	638	0	319	159	0	1116	35
Halfway Boulevard WB – Lane 1	326	16	186	31	0	559	40
Halfway Boulevard WB – Lane 2	326	16	186	31	0	558	40
Halfway Boulevard EB – Lane 1	134	0	67	33	0	234	40
Halfway Boulevard EB – Lane 2	133	0	67	33	0	233	40
1. vph: Vehicles per hour 2. mph: Miles per hour							

Traffic Noise Analysis – Halfway Boulevard Extended

Section 2: Sound Measurements and Analysis

TNM Model Results

The following results are the 2045 Build sound levels as determined in TNM, seen in TABLE 2.E. A graphical depiction of these results can be seen on Figure 4 found after page 3-10.

Impact Analysis

Using the 2045 build model sound levels, a determination of impact was made for the residence of NSA 01-B. Receptor M-04 represents the highest sound level for this NSA at 69 dB(A). MDOT SHA noise policy states that noise impacts occur for a residential area, or Category B, to be 1 dB(A) approaching the 67 dB(A) impact level; or 66 dB(A). Through a process known as isolation modeling, several noise models were run with future build traffic limited to set roadways. Through this process, the contributing roadway to a receptors noise level in question can be easily specified. To determine the effect of the Halfway Boulevard extension on land use 01-B (11818 Greencastle Pike), an isolation model was created, separating the traffic noise influence of the Halfway Boulevard extension. Results of the model prove future predicted traffic volumes of Greencastle Pike are clearly the primary contributor of traffic noise for this area. ***Therefore, there are not projected noise impacts within the project area for the proposed roadway improvements outlined in Section 1 and an investigation of noise abatement is not warranted.***

TABLE 2.E TNM Analysis Results						
Receptor Number	Residence Address or Property Description		Category	2045 Proposed Build Sound Level Leq (h)	Existing Worst Case Leq (h)	Impacted Receptor? (Yes/No)
M-01		Greencastle Pike	G	67	61	No ³
M-02	11818	Greencastle Pike	B	66	61	Yes ²
M-04	11818	Greencastle Pike	B	68	68	Yes ²
M-05	10228	Greencastle Pike	G	73	60	No
M-06	11901	Greencastle Pike	G	65	48	No
M-07	11901	Greencastle Pike	G	56	51	No
M-09		New Gate Boulevard	G	70	48	No ³
M-10	11901	Greencastle Pike	G	63	54	No
R-11	10228	Greencastle Pike	G	58	52	No
R-12	11901	Greencastle Pike	G	56	43	No
R-13	11901	Greencastle Pike	G	59	52	No
R-14	11901	Greencastle Pike	G	58	45	No
R-15	11901	Greencastle Pike	G	56	43	No
R-16	11901	Greencastle Pike	G	56	41	No
R-17	11901	Greencastle Pike	G	56	45	No
R-18		New Gate Boulevard	F	60	55	No
R-19	11901	Greencastle Pike	G	63	55	No
R-20	11901	Greencastle Pike	G	63	48	No
R-21	11901	Greencastle Pike	G	66	41	No ³
R-22	11901	Greencastle Pike	G	61	38	No
R-23	11901	Greencastle Pike	G	61	43	No
R-24		New Gate Boulevard	F	60	47	No

Traffic Noise Analysis – Halfway Boulevard Extended

Section 2: Sound Measurements and Analysis

Receptor Number	Residence Address or Property Description		Category	2045 Proposed Build Sound Level Leq (h)	Existing Worst Case Leq (h)	Impacted Receptor? (Yes/No)
R-25		New Gate Boulevard	F	61	52	No
R-26	11901	Greencastle Pike	G	68	61	No ³
R-27	11901	Greencastle Pike	G	67	50	No ³
R-28	11901	Greencastle Pike	G	74	43	No ³
R-29	11901	Greencastle Pike	G	72	38	No ³
R-30	11901	Greencastle Pike	G	68	40	No ³
R-31	11901	Greencastle Pike	G	66	42	No ³
R-32	11901	Greencastle Pike	G	64	49	No
R-33		New Gate Boulevard	F	65	56	No
R-34	11901	Greencastle Pike	G	68	39	No ³
R-35	11901	Greencastle Pike	G	68	59	No ³
R-36	11901	Greencastle Pike	G	66	51	No ³
R-37	11901	Greencastle Pike	G	62	39	No
R-38	11901	Greencastle Pike	G	56	35	No
R-39	11901	Greencastle Pike	G	63	40	No
R-40	11901	Greencastle Pike	G	65	38	No
R-41	11901	Greencastle Pike	G	67	45	No ³
R-42	11901	Greencastle Pike	G	68	53	No ³
R-43	11901	Greencastle Pike	G	62	52	No
R-44	11901	Greencastle Pike	G	59	42	No
R-45	11901	Greencastle Pike	G	51	33	No
R-46	11901	Greencastle Pike	G	59	37	No
R-47	11901	Greencastle Pike	G	59	36	No
R-48	11901	Greencastle Pike	G	61	41	No
R-49	11901	Greencastle Pike	G	62	47	No
R-50		Greencastle Pike	G	49	33	No
R-51		Greencastle Pike	G	54	35	No
R-52		Greencastle Pike	G	51	33	No
R-53	11901	Greencastle Pike	G	55	37	No
R-54	11901	Greencastle Pike	G	57	41	No
R-55	11901	Greencastle Pike	G	56	39	No
R-56		Halfway Boulevard	G	61	49	No
R-57		Halfway Boulevard	G	65	57	No
R-58	11825	New Gate Boulevard	G	63	54	No
R-59	11825	New Gate Boulevard	G	64	58	No
R-60	11825	New Gate Boulevard	G	64	58	No
R-61	11825	New Gate Boulevard	G	59	46	No
R-62	11825	New Gate Boulevard	G	59	47	No
R-63	11825	New Gate Boulevard	G	57	50	No

1. All Sound Levels are shown as hourly equivalent sound levels (Leq[h]) with units in A-weighted decibels (dB[A]).
2. Through isolation modeling the primary noise source for this receptor was determined to be a result of Greencastle Pike traffic volumes, not from the proposed Halfway Boulevard extension.
3. Since this site's land use falls under a 'G' category, impact assessment was determined unnecessary.

Traffic Noise Analysis – Halfway Boulevard Extended

Section 2: Sound Measurements and Analysis

Undeveloped Lands Noise Level Documentation

For undeveloped land (Category G) that is not permitted for development by the record of decision to proceed with the project, FHWA regulations and MDOT SHA require the assessment and reporting of future noise levels. The results must be documented in the noise analysis report. This requires the determination of the distance – measured from the proposed edge of the traveled way – to the NAC for the category G undeveloped lands. This serves to document how far off the roadway noise impacts occur for future land use planning purposes. Any noise abatement for such lands shall not be eligible for future Federal-aid participation.

The 2045 Build model noise levels for the land uses G-06 exceeds 66 dB(A) within 95 feet from the proposed roadway edge and 71 dB(A) 21 feet from the proposed roadway edge. These results have been provided in Table 2.F.

Table 2.F Land Use Activity Category G Area Distances			
Land Use Activity Category G Area	Distance from Nearest Edge of Shoulder to SHA Approach NAC 71 dB(A) [Category E] (feet)	Distance from Nearest Edge of Shoulder to SHA Approach NAC 66 dB(A) [Category B & C] (feet)	Notes
G-06	21	95	1
1. BOWMAN 2000 LLC undeveloped property			

Conclusions and Recommendations

Under the 2045 build conditions, the land uses that surround Halfway Boulevard extended, which are mostly undeveloped, are not considered impacted by the sound level increases due to the proposed roadway improvements for the project. According to 23 CFR 772 the noise study area would warrant investigation of noise abatement if a property was impacted. A property is considered impacted when a receptor has a sound level of 66 dB(A) or greater at a residence, or 71 dB(A) or greater at an office or restaurant with an outdoor frequent use area OR a 10-15 dB(A) increase over the existing condition. For this project, predicted sound levels in the NSAs did not exceed the impacted sound level criteria. Therefore, in accordance to standard FHWA and MDOT SHA practices and compliant to 23 CFR 772, the NSAs within the Halfway Boulevard Extended project area do not warrant investigation of noise abatement.

Although no formal noise abatement is mandatory for this phase of development, noise-compatible planning measures are recommended to account for likely future expansion. These voluntary measures may include avoidance through design practices, developer noise barriers, berms, landscaping, or strategic orientation of building features. For example, balconies and patios located with the building structure between the outdoor space and the roadway will receive some shielding from the building itself. Locating less noise sensitive structures closest to the roadway will provide a buffer for the more sensitive uses. Likewise, locating bedrooms or other noise sensitive indoor spaces on the side of the structure furthest from the roadway will improve the experience of the end user. Some of these methods can also be used as cost cutting measures, such as using excess fill as a visual berm that will provide some shielding from tire noise as an alternative to paying disposal costs.



Washington County Vicinity Map

Scale in Feet

Legend

Land Use Activity Category A Noise Sensitive Area (EXTERIOR)	Land Use Activity Category D Noise Sensitive Area (INTERIOR)	Land Use Activity Category G Non-Noise Sensitive
Land Use Activity Category B Noise Sensitive Area (EXTERIOR)	Land Use Activity Category E Noise Sensitive Area (EXTERIOR)	Proposed Roadway Extension
Land Use Activity Category C Noise Sensitive Area (EXTERIOR)	Land Use Activity Category F Non-Noise Sensitive	

October 2018

Washington County
Maryland

Division of Engineering
Construction Management

Wallace Montgomery

Halfway Boulevard Extended

Technical Noise Analysis Report

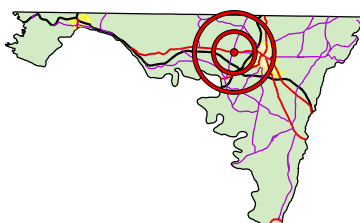
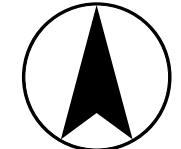



Washington County

Halfway Boulevard Extended
to Greencastle Pike (MD 63)

Land Use Map

Figure 2



 <p>Washington County Vicinity Map</p>	 <p>0 400 Scale in Feet</p>	Legend			October 2018	Halfway Boulevard Extended Technical Noise Analysis Report Washington County Halfway Boulevard Extended to Greencastle Pike (MD 63)
		 Calibrating Model Point (Short-term Noise Measurement)	 Non-Calibrating Model Point (Short-term Noise Measurement)	 24 Hour Receptor Site	Calibrating Model Points are those in which the Modeled Noise Level is within 3 dB(A) of the Measured Noise Level Non-Calibrating Model Points are those in which the difference (+ or -) between the Modeled Noise Level and the Measured Noise Level is greater than 3 dB(A).	

TNM Model Validation Map

Figure 3



Washington County Vicinity Map

Scale in Feet

Legend

- TNM Modeled Receptor Site
- Proposed Noise Level (dB[A])
- Existing Worst Case Noise Level (dB[A])
- Proposed Roadway Extension

October 2018

Washington County
Maryland

Division of Engineering
Construction Management

Wallace Montgomery

Halfway Boulevard Extended

Technical Noise Analysis Report

Washington County

Halfway Boulevard Extended
to Greencastle Pike (MD 63)

Impact Analysis Map

Figure 4

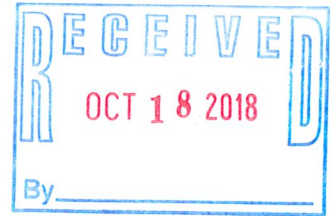
201805507



Washington County

M A R Y L A N D

DIVISION OF
ENGINEERING



FARC

October 15, 2018

Maryland Historical Trust
Attn: Ms. Elizabeth Cole
100 Community Place
Crownsville, Maryland 21032

Re: Appalachian Regional Commission Grant
Halfway Boulevard Extended
County Project No. 10-273

The Maryland Historical Trust has determined
that there are no historic properties affected by
this undertaking.

Tim Tamburino Date 11/8/18
TIM TAMBURINO

TST/ETC

Dear Ms. Cole,

A grant from the Appalachian Regional Commission has been awarded to Washington County, MD for construction of a four lane minor arterial roadway, consisting of two twelve foot lanes in each direction with an eighteen foot grass median/center left turn lane, and eight foot wide shoulders. Federal funds are being used for this project, thus in compliance with Section 106 of the National Historic Preservation Act, the Maryland Historical Trust is being notified of the project with this initial letter.

Halfway Boulevard intersects New Gate Boulevard, located to the west of Interstate 81. The existing section of Halfway Boulevard is surrounded by a combination of commercial development and distribution centers. The Stone Farmstead/Black Walnut farm, located at 11901 Greencastle Pike, contains a bank barn that is eligible for the National Register. This structure is located several hundred feet north of the proposed roadway.

The new roadway extension project will be constructed within undeveloped land currently used for agricultural purposes. Right-of-way for the project will be obtained by dedication from adjacent property owners. No buildings or structures will be disturbed as part of this project.

Thank you for taking the time to review this project location. Please provide any historical property information necessary. If you have any questions, please contact me at (240) 313-2402.

Sincerely,

Mark Mishler
Civil Engineer

Attachments: Halfway Boulevard Extended Project Vicinity Map

RECEIVED

NOV 14 2018

WASH. CO. DIV. OF ENGINEERING
& CONSTRUCTION MANAGEMENT

80 West Baltimore Street | Hagerstown, MD 21740 | P: 240.313.2460 | Hearing Impaired: 7-1-1

1A TST/ETC 11/8/18

WWW.WASHCO-MD.NET



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, Maryland 21401
<http://www.fws.gov/chesapeakebay>



RECEIVED

NOV - 7 2018

WASH. CO. DIV. OF ENGINEERING
& CONSTRUCTION MANAGEMENT

May 21, 2014

Re: Quicker and easier online project review process for Delaware, Maryland and Washington, D.C.

To whom this concerns:

Although workloads continue to increase at the U.S. Fish and Wildlife Service's Chesapeake Bay Field Office, we are dedicated to providing the public with the best, most efficient service possible. Therefore, we have developed an online project review process to identify whether a project will or will not impact federally-listed endangered or threatened species in Delaware, Maryland and Washington, D.C.

We are asking all those with the capability to use this online process to go to:

<http://www.fws.gov/chesapeakebay/EndSppWeb/ProjectReview/Index.html>

Using this website will take approximately 15 minutes and you will receive an immediate answer regarding whether your project will potentially impact federally listed endangered or threatened species and, if need be, any further instructions. Please contact Trevor Clark of my staff at (410) 573-4527 or by email at Trevor_Clark@fws.gov if you have any questions about the online review process or are unable to use this online tool.

Sincerely,

Genevieve LaRouche
Supervisor





Larry Hogan, Governor
Boyd Rutherford, Lt. Governor
Mark Belton, Secretary
Joanne Throwe, Deputy Secretary

November 8, 2018

Mr. Mark Mishler
Washington County
Division of Engineering and Construction Management
80 West Baltimore Street
Hagerstown, Maryland 21740

RECEIVED

NOV 16 2018

WASH. CO. DIV. OF ENGINEERING
& CONSTRUCTION MANAGEMENT

RE: Environmental Review for Appalachian Regional Commission Grant, Halfway Boulevard Extended, County Project No. 10-273, Washington County, Maryland.

Dear Mr. Mishler:

The Wildlife and Heritage Service has determined that there are no official State or Federal records for listed plant or animal species within the delineated area shown on the map provided. As a result, we have no specific concerns regarding potential impacts or recommendations for protection measures at this time. Please let us know however if the limits of proposed disturbance or overall site boundaries change and we will provide you with an updated evaluation.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at (410) 260-8573.

Sincerely,

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2018.1600.wa